

CLAIM AMENDMENTS

1. (Currently amended) A starting apparatus of an internal combustion engine comprising:

a main air passage including an intake manifold for supplying air to each cylinder of the engine,

a throttle valve provided upstream of the intake manifold in the main air passage,

a bypass air passage provided to bypass the throttle valve in parallel to the main air passage and connected close to the intake port of each cylinder, a vaporization fuel supply means for supplying vaporized fuel to the bypass air passage, and a bypass air control valve capable of controlling the incoming air quantity into the bypass air passage,

wherein main air control valves for the main air passage are provided near intake ports in respective pipes of the intake manifold.

2. (Original) A starting apparatus of an internal combustion engine according to claim 1, wherein at the time of start-up cranking, the bypass air control valve is opened and the main air passage is closed or throttled by the main air control valves, further vaporized fuel is supplied to the bypass air passage by the vaporization fuel supply means.

3. (Original) A starting apparatus of an internal combustion engine comprising:

a main air passage including an intake manifold for supplying air to each cylinder of the engine,

a bypass air passage provided in parallel to the main air passage and connected close to the intake port of each cylinder,

a bypass air control valve that is capable of controlling the incoming air quantity into the bypass air passage and opened at the time of start-up cranking,

a vaporization fuel supply means for supplying vaporized fuel to the bypass air passage, and

fuel injection valves that are installed near respective intake ports of cylinders of the engine or installed directly in respective cylinders, and inject the maximum fuel quantity of themselves available in the cranking period within a specified length of time after the beginning of start-up cranking, and then decreases the injected fuel quantity or stops injection in the rest of the cranking period after injecting the maximum fuel quantity.

4. (Original) A starting apparatus of an internal combustion engine according to claim 1, wherein the vaporization fuel supply means comprises an auxiliary fuel injection valve and a heater for heating the fuel injected from the auxiliary fuel injection valve.

5. (Previously presented) A starting method of an internal combustion engine comprising: a main air passage including an intake manifold for supplying air to each cylinder of the engine, fuel injection valves that are installed near respective intake ports of cylinders of the engine or installed directly in respective cylinders, a bypass air passage provided in parallel to the main air passage and connected close to the intake port of each cylinder, a vaporization fuel supply means for supplying vaporized fuel to the bypass air passage, and a bypass air control valve capable of controlling the incoming air quantity into the bypass air passage,

wherein at the time of start-up cranking, the bypass air control valve is opened and vaporized fuel is supplied to the bypass air passage from the vaporization fuel supply means, and the fuel injection valves inject the maximum fuel quantity of themselves available in the cranking period within a specified time after the beginning of start-up cranking, and a time for decreasing the injected fuel quantity or stopping the injection is set in the rest of the cranking period after injecting the maximum fuel quantity.

6. (Currently amended) A control method of an internal combustion engine equipped with ~~the a~~ starting apparatus ~~according to claim 1, comprising a main air passage including an intake manifold for supplying air to each cylinder of the engine, a bypass air passage provided in parallel to the main air passage and connected close to the intake port of each cylinder, a vaporization fuel supply means for supplying vaporized fuel to the bypass air passage, and a bypass air control valve capable of controlling the incoming air quantity into the bypass air passage and in which main air control valves for the main air passage are provided near intake ports in respective pipes of the intake manifold, the control method comprising:~~

~~wherein stopping the internal combustion engine is stopped automatically when the specified idling stop permissible conditions are satisfied,~~

~~opening the bypass air control valve is opened and actuating the start-up cranking is actuated when the specified engine start conditions are satisfied after the engine has stopped by satisfaction of the specified idling stop permissible conditions, and~~

~~supplying the vaporized fuel is supplied to the bypass air passage from the vaporization fuel supply means during start-up cranking.~~

7. (Currently amended) A control method of an internal combustion engine equipped with ~~the a~~ starting apparatus ~~according to claim 4, comprising a main air passage including an intake manifold for supplying air to each cylinder of the engine, a bypass air passage provided in parallel to the main air passage~~

and connected close to the intake port of each cylinder, a vaporization fuel supply means for supplying vaporized fuel to the bypass air passage, and a bypass air control valve capable of controlling the incoming air quantity into the bypass air passage, in which main air control valves for the main air passage are provided near intake ports in respective pipes of the intake manifold, and in which the vaporization fuel supply means comprises an auxiliary fuel injection valve and a heater for heating the fuel injected from the auxiliary fuel injection valve, the control method comprising:

wherein stopping the internal combustion engine is stopped automatically when the specified idling stop permissible conditions are satisfied,

energizing the heater is energized for a specified time when the specified heater energization energization conditions are satisfied,

after that, setting a non-energization non-energization period of the heater is set after energization of the heater for the specified time,

and also actuating start-up cranking is actuated when the specified engine start conditions are satisfied after the internal combustion engine has stopped by the satisfaction of the idling stop permissible conditions, and

supplying vaporized fuel is supplied to the bypass air passage from the vaporization fuel supply means during start-up cranking.

8. (Currently amended) An exhaust filtration apparatus installed in an exhaust pipe of an internal combustion engine equipped with the starting apparatus according to claim 1 claim 3, wherein the exhaust filtration apparatus

comprises a catalyst that holds no HC absorbent.

9. (Currently amended) An exhaust filtration apparatus installed in an exhaust pipe of an internal combustion engine equipped with the starting apparatus according to ~~claim 1~~ claim 3, wherein the exhaust filtration apparatus has one or more support containers on the exhaust pipe, and the catalyst supports filled into one of the support containers hold HC absorbents.

10. (Currently amended) An exhaust filtration apparatus installed in an exhaust pipe of an internal combustion engine equipped with the starting apparatus according to ~~claim 1~~ claim 3, wherein the exhaust filtration apparatus has plural support containers in the exhaust pipe, and the catalyst supports filled into any one of the support containers, that are located in the downstream of the exhaust pipe compared to the support container located in most upstream of the same, hold HC absorbents.